PATENT SPECIFICATION 888,798

DRAWINGS ATTACHED.

Inventors:—JAMES LEE NOCK and HARRY WEATHERALL.

Date of filing Complete Specification: Sept. 18, 1958.

Application Date : Sept. 19, 1957. No. 29541/57.
(Patent of Addition to No. 729,471, dated July 9, 1953).

Complete Specification Published : Feb. 7, 1962.

Index at Acceptance:—Class 20(1), H1D.

International Classification :—E04h.

COMPLETE SPECIFICATION.

Improvements in Pole and Like Structures for the Support of Electric Transmission Lines and Other Purposes.

ERRATA

SPECIFICATION NO. 888,798

Page 3, line 108, *for* "plate" *read* "plates"

Page 4, line 36, *delete* "for other purposes, comprises two legs"

Page 4, line 87, *after* "chamfering" *insert* "or"

THE PATENT OFFICE,
16th July, 1962

DS 66109/1(8)/R.109 200 7/62 PL

mediate the length of the cross-members.

The present invention is an improvement in or modification of that claimed in our prior Patent referred to above. According to the present invention a lattice pole for supporting overhead transmission lines or for other purposes, comprises two legs each consisting of two longitudinally extending members of L-shaped cross-section (hereinafter termed angles), spaced apart and so disposed that two sides of the angles extend inwards towards one another with their edges spaced apart and lying in the same plane and the two other sides project in the same direction and the gap between the said edges is bridged by a number of flat plates lying in said plane whose edges are welded to the adjacent edges of the angles and which are spaced longitudinally of the

illustrating one form of construction by way of example, and wherein:—

Figure 1 is a front elevation with certain parts omitted, and others shown broken away;

Figure 2 is a side elevation of Figure 1;

Figure 3 is a plan of Figure 1 drawn to an enlarged scale; and

Figures 4, 5 and 6 are fragmentary views also drawn to an enlarged scale, showing certain details of the construction.

The lattice pole, a portion only of which is illustrated, has two legs 1 which are spaced apart and are parallel with one another. Each leg comprises two angles 2 which are spaced apart and each angle has a side 3 which projects inwards towards the side 3 of the other angle of the leg. Each angle 2 of each leg 1 has a free side 4 and

BNSDOCID: <GB___888798A_I_>

PATENT SPECIFICATION 888,798

DRAWINGS ATTACHED.

Inventors: —JAMES LEE NOCK and HARRY WEATHERALL.

Date of filing Complete Specification: Sept. 18, 1958.

Application Date : Sept. 19, 1957. No. 29541/57.
(Patent of Addition to No. 729,471, dated July 9, 1953).

Complete Specification Published : Feb. 7, 1962.

Index at Acceptance:—**Class 20(1), H1D.**

International Classification :—E04h.

COMPLETE SPECIFICATION.

Improvements in Pole and Like Structures for the Support of Electric Transmission Lines and Other Purposes.

We, PAINTER BROTHERS LIMITED, a British Company, of Hereford Steel Works, Mortimer Road, Hereford, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement: —

This invention relates to improvements in metal lattice or openwork poles of the kind used for supporting overhead electric transmission lines. In the Complete Specification of our Patent No. 729,471 there is described and claimed an openwork metal pole having two legs, each leg comprising a pair of spaced tubular members connected at spaced points along their length by horizontal cross-members, the two legs being connected by braces extending between the cross-members and directed to points intermediate the length of the cross-members.

The present invention is an improvement in or modification of that claimed in our prior Patent referred to above. According to the present invention a lattice pole for supporting overhead transmission lines or for other purposes, comprises two legs each consisting of two longitudinally extending members of L-shaped cross-section (hereinafter termed angles), spaced apart and so disposed that two sides of the angles extend inwards towards one another with their edges spaced apart and lying in the same plane and the two other sides project in the same direction and the gap between the said edges is bridged by a number of flat plates lying in said plane whose edges are welded to the adjacent edges of the angles and which are spaced longitudinally of the angles, the bridging plates of one leg being longitudinally staggered relative to those of the other leg and the two legs of the pole being attached to one another by braces which extend between and are attached to the bridging plates of one leg and those of the other leg.

The angles forming the longitudinally extending members of L shaped cross-section may each be of uniform cross-section throughout their length or their cross-section may change at one or more points in their length. This may most readily be achieved by building up each longitudinally extending member of two or more angles of different cross-section and jointing them end to end in any suitable manner to form thereby a single longitudinally extending member.

The invention will be described further with the aid of the accompanying drawings illustrating one form of construction by way of example, and wherein: —

Figure 1 is a front elevation with certain parts omitted, and others shown broken away;

Figure 2 is a side elevation of Figure 1;

Figure 3 is a plan of Figure 1 drawn to an enlarged scale; and

Figures 4, 5 and 6 are fragmentary views also drawn to an enlarged scale, showing certain details of the construction.

The lattice pole, a portion only of which is illustrated, has two legs 1 which are spaced apart and are parallel with one another. Each leg comprises two angles 2 which are spaced apart and each angle has a side 3 which projects inwards towards the side 3 of the other angle of the leg. Each angle 2 of each leg 1 has a free side 4 and

BNSDOCID: <GB 888798A >

the free sides of the two angles of each leg extend in the same direction and are parallel with one another. All four angles of the two legs 1 are of the same dimensions and the free sides 4 of the angles of one leg project towards the corresponding sides of the angles of the other leg. The sides 3 of the two angles of each leg 1 lie in the same plane and the free sides 4 of the angles of one leg lie in the same plane as the free sides of the corresponding angles of the other leg. The angles 2 of each leg 1 extend longitudinally of the lattice pole and the four angles form the corners of a rectangle when the pole is viewed at right angles to its length.

The two angles 2 of each leg 1 are connected by a series of bridging plates 5 which are placed between the sides 3 of the angles and are welded to those sides. The bridging plates are rectangular in shape and have a length just sufficient to enable them to bridge the gap between the sides 3 of the two angles. Before the bridging plates 5 are welded to the edges of the sides 3 of the angles, the edges of the plates are chamfered or bevelled off on both sides of each plate as indicated at 6 and 19 in Figure 4. This chamfering or bevelling off forms a sharp edge 20 which during the welding operation is forced hard against the adjacent edge of the side 3 to prevent the escape of welding metal from one side of the bridging plate 5 to the other. During welding the gap between the edge 6 and the adjacent edge of the side 3 is on the upper side of the assembled parts. The reference numeral 7 indicates the welding metal. By chamfering or bevelling off the two end edges of the bridging plate on the same side of the plate, the welding metal need be applied from one side only and a saving of time and expense thereby effected. Where found necessary or desirable, however, additional welding metal may be applied to the adjacent end edges of the bridging plate and side 3 of an angle on the opposite sides of those plates, the reference numerals 8 in Figure 3 indicating the additional welding metal. The bridging plates 5 conveniently are of the same thickness as that of the sides 3 and when welded to the sides 3 of the two angles of a leg, lie substantially flush with those sides. Each leg 1 thus consists of two angles 2 connected together by a series of bridging plates 5, the latter being spaced apart longitudinally of the leg. In the Figures, the bridging plates 5 are shown extending at right angles to the angles 2, but they could be arranged to extend obliquely to the angles of the leg. The chamfering or bevelling off of the end edge of a bridging plate 5 may extend the full depth of the plate, that is to say, from the upper side edge to the lower side edge or to some point between those side edges.

The two legs 1 of the lattice pole are connected together by a series of braces 9 which are attached at their ends to the bridging plates 5. The latter are spaced apart equidistantly longitudinally of the legs, the spacing between adjacent bridging plates 5 of one leg being equal to the spacing of the bridging plates of the other leg, but the bridging plates of one leg are staggered with respect to those of the other leg by one half the spacing between successive plates. The braces 9 are disposed obliquely to the two legs 1 of the lattice pole and the adjacent ends of two braces are connected to a bridging plate 5 of one leg and the opposite end of those braces are connected respectively to adjacent bridging plates 5 of the other leg.

The braces are also made of angles and are so connected to the bridging plates 5 that when the lattice pole is brought to the vertical position in which it is to be used, the corners or apices of the angles are on the upper sides of the braces. The apices of the braces 9 are indicated in Figures 1 and 3 by the reference numerals 10.

The braces 9 are bolted to the bridging plates 5, the method of attachment being shown in Figure 5. To facilitate the attachment each brace is shaped at one end to provide a flattened portion 11 and an adjacent end portion 12 extending at right angles to the flattened portion. The end portion 12 lies in a plane which is oblique to the longitudinal axis of the brace and lies on the same side of the apex 10 of the brace as the edges of the two sides of the angle forming the brace.

The other end of the brace 9 is shaped to provide a bent-over portion 13 and an adjacent end portion 14 extending in the opposite direction to the end portion 12 in relation to the brace and at right angles to the portion 13. When a brace 9 is to be attached to a bridging plate of one leg and to a bridging plate of the other leg, the brace is so disposed between the two bridging plates, that the end portion 12 at one end of the brace lies flat against one of the bridging plates and the end portion 14 at the opposite end of the brace lies against the end portion 12 of another brace 9. As will be seen from Figure 5 the adjacent ends of two braces are secured together and to a bridging plate 5 by a bolt 15 having a head 16 and a nut 17 on the bolt, the bolt being passed through holes in the end portions 12 and 14 and through a hole in the bridging plate 5. When the parts are assembled, the bolt head 16 lies on the inside of the bridging plate and the nut 17 on the outside thereof, a washer 18 being interposed between the plate and the nut. To prevent the bolt from turning while the nut 17 is

BNSDOCID: <GB___888798A__I_>

being tightened, the bolt head 16, as will be seen from Figure 6, is provided on one side with a V-shaped notch 21 which is entered by the bent-over portion 13 of the lower of the two braces 9 when the parts are assembled so that the bolt 15 is prevented from turning during the tightening of the nut 17. The adjacent ends of all the braces 9 are attached to the bridging plates 5 in the same manner. Where the lattice pole is required to have additional shear strength one or more sets of braces may be used on opposite sides of the set of braces shown, the additional braces being bolted to the sides 3 of the angles 2 and arranged in parallel or in opposition to braces 9.

The lattice pole may be modified in various respects. For example, instead of the free sides of the angles of one leg extending inwards towards the free sides of the angles of the other leg, the angles of one leg may be so disposed relative to those of the other leg that the corresponding angles have their free sides extending away from one another. The arrangement in which the free sides of the corresponding angles of the two legs extend inwards towards one another, however, will be used generally. Furthermore, the two angles of each leg may be inclined towards one another but preferably the angles will be disposed in parallel relationship and preferably the spacing between the two angles of one leg is made equal to the spacing between the angles of the other leg, in which case the bridging plates can be of all the same length, assuming of course, that the angles of the two legs are all disposed in parallel relationship. The spacing of the bridging plates of one leg need not necessarily be the same as that of the bridging plates of the other leg and angles need not necessarily be used for the braces.

Poles built up of component parts in accordance with the invention are of very simple construction whereby economies in the use of the metal used for the components can be effected and a relatively few components of differing sizes need be stocked for the building up of the complete poles. All the components are of simple design and can be readily and quickly assembled and poles of considerable height can be manufactured capable of fulfilling the physical requirements of such structures when used for supporting overhead transmission lines, overhead electric traction systems, as lighting standards or for other purposes.

WHAT WE CLAIM IS:—

1. A metal lattice pole for supporting overhead electric transmission lines or for other purposes, comprising two legs each consisting of two longitudinally extending angles spaced apart and so disposed that two sides of the angles extend inwards towards one another with their edges spaced apart and lying in the same plane and the two other sides project in the same direction, the gap between the said edges being bridged by a number of flat plates lying in said plane whose edges are welded to the adjacent edges of the angles and which are spaced longitudinally of the angles, the bridging plates of one leg being longitudinally staggered relative to those of the other leg and the two legs of the pole being attached to one another by braces extending between and bolted to the bridging plates of the two legs.

2. A metal lattice pole for supporting overhead electric transmission lines or for other purposes, according to Claim 1, wherein the braces are angles.

3. A metal lattice pole for supporting overhead electric transmission lines or for other purposes having two legs each of which consists of two longitudinally extending angles spaced apart and so disposed that two sides of the angles extend inwards towards one another with their edges spaced apart and lying in the same plane and the two other sides project in the same direction, the gap between the said edges being bridged by a number of flat plates lying in said plane whose edges are welded to the adjacent edges of the angles and which are spaced longitudinally of the angles, the spacing of the bridging plates of one leg being equal to that of the other leg and the bridging plates of one leg being longitudinally staggered relative to those of the other leg by one half the spacing between successive plates, two adjacent bridging plates of one leg and the bridging plate of the other leg lying between those plates being connected by a pair of braces, one of the pair being connected to each of the two adjacent bridging plate and both braces of the pair being connected to the bridging plate of the other leg.

4. A metal lattice pole for supporting overhead electric transmission lines or for other purposes comprising two legs each of which consists of two longitudinally extending angles spaced apart and so disposed that two sides of the angles extend inwards towards one another with their edges spaced apart and lying in the same plane and the two other sides project in the same direction, the gap between the said edges being bridged by a number of flat plates lying in said plane whose edges are welded to the adjacent edges of the angles and which are spaced longitudinally of the angles, the bridging plates of one leg being longitudinally staggered relative to those of the other leg, braces formed as angles connecting pairs of bridging plates of one leg and bridging plates lying between the pairs of the other leg and attached to the plates by

BNSDOCID: <GB___888798A_I_>

bolts passing through the adjacent ends of a pair of braces and the adjacent bridging plate, the bolt heads lying on the inside of the longitudinally extending angles and having notches entered by an end portion of an adjacent brace.

5. A metal lattice pole for supporting overhead electric transmission lines or for other purposes constructed substantially as described and shown in the accompanying drawings.

H. H. DAKER,
Agent for the Applicants,
21 Bloomsbury Street,
London, W.C.1.

PROVISIONAL SPECIFICATION.

Improvements in Pole and Like Structures for the Support of Electric Transmission Lines and Other Purposes.

We, PAINTER BROTHERS LIMITED, a British Company, of Hereford Steel Works, Mortimer Road, Hereford, do hereby declare this invention to be described in the following statement: —

This invention relates to improvements in metal lattice or openwork poles of the kind used for supporting overhead electric transmission lines. In the Complete Specification of our Patent No. 729,471 there is described and claimed an openwork metal pole having two legs, each leg comprising a pair of spaced tubular members connected at spaced points along their length by horizontal cross-members, the two legs being connected by braces extending between the cross-members and directed to points intermediate the length of the cross-members.

The present invention is an improvement in or modification of that claimed in our prior patent referred to above. According to the present invention a lattice pole for supporting overhead transmission lines or for other purposes, comprises two legs for other purposes, comprises two legs each consisting of two longitudinally extending members of L-shaped cross-section (thereinafter termed angles), spaced apart and so disposed that two sides of the angles extend inwards towards one another with their edges spaced apart and lying in the same plane and the two other sides project in the same direction and the gap between the said edges is bridged by a number of cross-members which are spaced longitudinally of the angles and are attached to the angles, the cross-members of one leg being placed out of alignment with those of the other leg and the two legs of the pole being attached to one another by braces which extend between and are attached to the cross-members of one leg and those of the other leg.

The angles of one leg may be so positioned in relation to those of the other leg that the corresponding angles of the two legs have their free sides extending towards one another so that in the complete structure the longitudinally extending angles form the corner portions of a rectangle when viewed at right angles to the length of the pole. Alternatively, the angles of one leg may be so positioned relative to those of the other leg that the corresponding angles have their free sides extending away from one another. The two angles of each leg may be inclined towards one another but preferably the angles are disposed in parallel relationship and the spacing between the angles of one leg is the same as that between the angles of the other leg so that cross-members connecting together one pair of angles may all be made of the same length and be equal to that of the cross-members connecting the pair of angles of the other leg. These cross-members may extend at right angles to the angles forming the leg and be secured to them by making the cross-members of just sufficient length to bridge the gap between the edges of the angles and welding the edges of the cross-members to the adjacent edges of the angles. Alternatively, the cross-members may extend obliquely to the angles of the leg.

The welding of the edges of the cross-members to the adjacent edges of the angles, preferably, is effected by chamfering bevelling off the edges at the ends of the cross-members to form gaps between those edges and the edges of the angles and to fill the gaps with welding metal while the cross-member and the angle are being pressed together. By chamfering or bevelling off the two end edges from the same side of the cross-member, the welding metal need be applied from one side of the cross-member only and a saving of time and expense thereby effected. The chamfer may extend from one side of the cross-member to the other or to some point between the two sides.

The spacing of the cross-members of one leg may be made equal to that of the other leg and the cross-members of one leg may be longitudinally staggered relative to those of the other leg by one half the spacing between successive cross-members. Two adjacent cross-members of one leg and the cross-member of the other leg lying between

BNSDOCID: <GB___888798A_I_>

those cross-members are connected by a pair of braces, one being connected to each of the two adjacent cross-members and both braces of the pair being connected to the cross-member of the other leg. The braces may also be angles, in which case, their ends may be flattened and bent to facilitate their attachment to the cross-members with the aid of bolts and nuts.

The bolts used for attaching the braces to the cross-members may have notched heads which can be placed over the lower brace of a pair to prevent the bolt turning while the nuts are being turned to secure the upper and lower braces of a pair to a cross-member.

Poles built up of component parts in accordance with the invention are of very simple construction whereby economies in the use of the metal used for the components can be effected and a relatively few components of differing sizes need be stocked for the building up of the complete poles. All the components are of simple design and can be readily and quickly assembled and poles of considerable height can be manufactured capable of fulfilling the physical requirements of such structures when used for supporting overhead transmission lines.

H. H. DAKER,
Agent for the Applicants,
21 Bloomsbury Street,
London, W.C.1.

Abingdon : Printed for Her Majesty's Stationery Office, by Burgess & Son (Abingdon), Ltd.—1962.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2,
from which copies may be obtained.

BNSDOCID: <GB ___ 888798A I >

888,798 COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

1 & 2 & 5

FIG. 1.

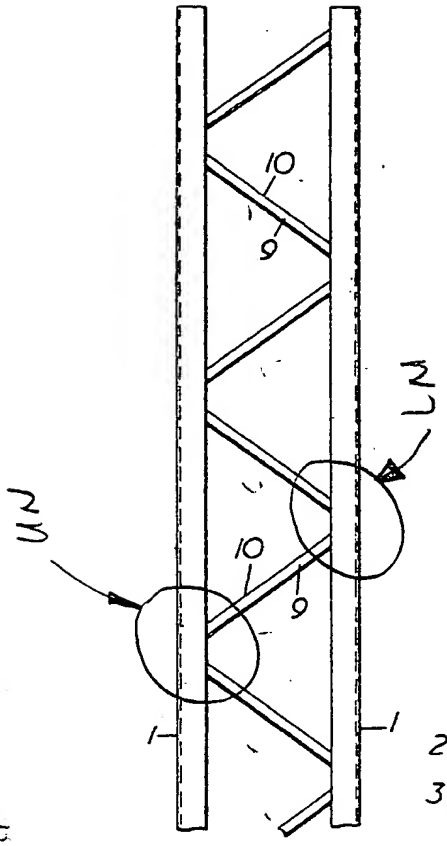


FIG. 2.

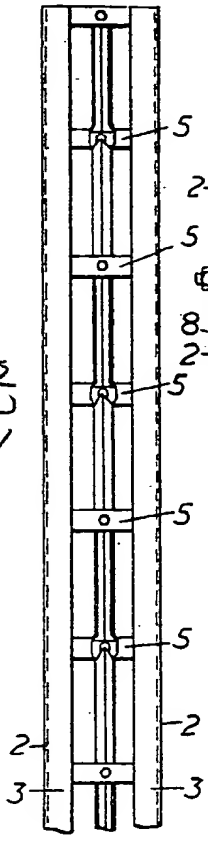
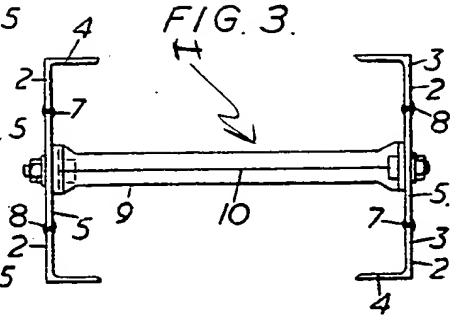


FIG. 3.



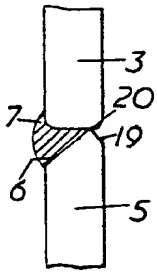
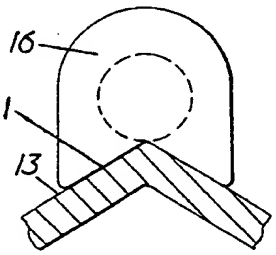


FIG. 4.

FIG. 6.



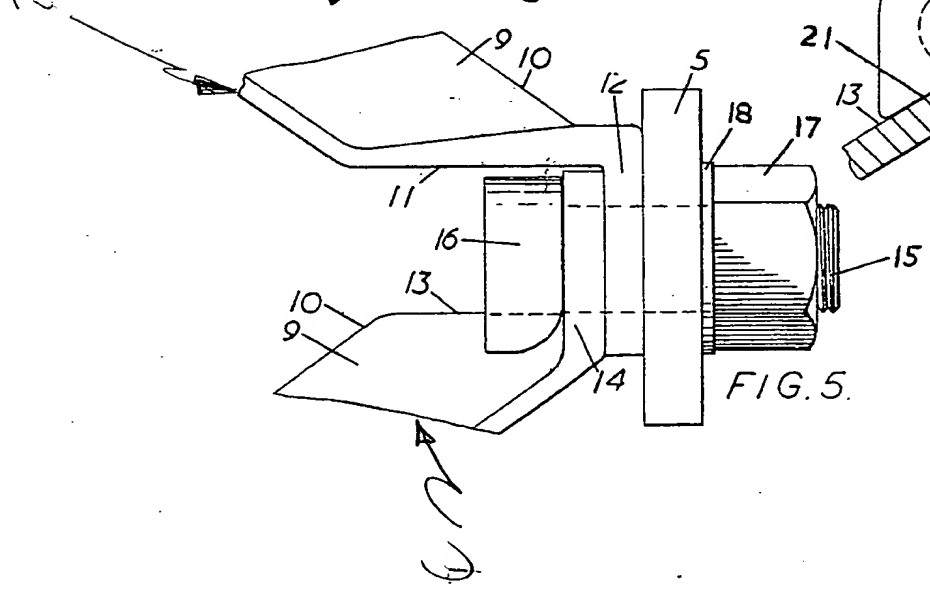


FIG. 5.

BNSDOCID: <GB___888798A_1_>